

# EPILEPSY

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## DEFINITION:

- There is no satisfactory definition, but just describing the phenomenon.
- Epileptic seizures are abnormal & excessive focal or generalized electric discharge of neurons (usually the cortex ) usually accompanied by observable behavioral abnormality.
- Epilepsy is phenomena due to discharge of brain not from the spinal cord, and most be from the cortex , and it is electric (recorded by EEG).
- Symptoms of brain hyper excitability not the spinal cord which may normal individual.
- When the electric discharge is coming from whole the cortex, we call it **Generalized**.
- When it is from a focus (part of the brain) in the cortex, we call it **focal discharge**.

So , epilepsy is a phenomena due to cortical discharges, either generalized and we call it a generalized epilepsy , or focal and we call it focal epilepsy.

- Epilepsy like Bronchial Asthma, when someone expose to dust, he will have bronchospasm, and we don't call it asthma.

So, Asthma is the repetition of bronchospasm, having attack from time to time.

MEAN?

- Seizure is not epilepsy and convulsion is not epilepsy ,because someone who had head trauma or RTA , he may have **convulsion** but this is **not epilepsy**.
- Epilepsy is characterized by recurrent convulsions, and occur without trigger.
- The seizure is the act of convulsion.
- Seizure may last for 1,2 or 3 minutes but rarely exceeding 5 min.
- When one episode last for half-hour or more ,or having seizure then stop, then have another seizure and so without regaining consciousness then we call it status epilepticus.
- Status epilepticus: It is a continuous attack or attack followed by another one without gaining the conscious. It's a **MEDICAL EMERGENCY**.
- There are 2 form of seizures:
  1. **Spontaneous** without provoking.
  2. **Provoked** (some patients has reflex epilepsy which is happen when they exposed to some provoking factors they will have convulsion, such as when they listen to music or exposure to cold will induce the convulsion)
- Epilepsy can happen any time.

### EPIDEMIOLGY:

- 5-7% of general population they may have seizures sometime during their life so, it's not unusual.
- 1-2% will develop epilepsy.(the incidence) very common.
- Peak of epilepsy: new born, 1st decade & elderly.
- 50% are idiopathic.
- 80% will respond to treatment.

الصرع : كلمة مشتقة من  
(صرعته الجن) وهناك أمثلة  
كثيرة على شخصيات تاريخية  
بارزة مصابين بهذا المرض لعل من  
أهمهم هو نابليون بونابرت.

Q: Is epilepsy inherited disease?

- In Most patient , **it is not** (most of patients do not have a family history ) but there is a tendency. it's like DM type 2 by which if there is a family history it will increase chance of developing epilepsy. But there are some exceptions for example, the Juvenile Myoclonic Epilepsy (JME) is inherited.

### ETIOLOGY:

- In 50% of cases, it has a cause which is depend on age.
- For example: in **new born & infant**, the most common cause is **congenital abnormality & trauma during delivery** and so on, but the **elderly** may due to **infarction & brain tumor, hemorrhage**, drugs and so on.
- **But most of cases are unknown causes.**

### CLASSIFICATION:

- Epilepsy can be divided in to two parts partial and generalized:
  1. **Partial:** Started on focus (part of the brain & depend on which part e.g. if affect motor area it will give motor symptoms and when it affect the visual area (occipital cortex) it will cause visual symptoms) and patients still conscious.  
It includes:
    - a) **Simple partial** (or partial simplex) :
      - Patients are fully conscious & could affect the:
        - **Motor area:** which may affect one finger (Jaksonain type), whole arm or whole limb side and the patient cannot control it and he come and describe it.
        - **Sensory type:** feeling numbness & tingling (serotype) affect part of the body.
        - **Autonomic type:** e.g. increasing the salivation and abdominal pain.
        - **Psychiatric type:** patients are aggressive or abnormal behavior  
( المريض يكون طبيعي ثم فجأة يتغير سلوكه بسبب النوبة فيبدأ يكسر كل شيء حوله )
  - ★ The partial type (either simple or complex) may marsh (يتطور) to involve the whole brain and become general and we call it: **Secondary Generalized.**

b) **Complex partial** (or partial complex):

- The patient still conscious but he is **not very bright** ( there is cloudiness in consciousness) ( المريض واعى ولكن يكلمك كأنه سكران )
- With or without automatisms (impairment of conscious) it's much form like:
  - Impairment of conscious at time of onset.
  - Simple partial onset followed by impairment of conscious.
  - Doing some act but not aware of it like opening and closing his buttons he may take his keys, go to his car or go to path room.

★ May march to whole brain & it is difficult to treat.

2. Generalized:

- Before the attack, there is **preictal symptom** (in past we call it an **aura**) when you ask the patients what happened before you loss consciousness, they may tell you that they see something, smell something, wet themselves or bite their tongues & that indicate the epilepsy start from focus then it become generalized.
- Then, the **ictus state** (the act he was doing while he is in the seizure when losing the consciousness)
- If patients says that he suddenly collapse and he start to describe what happen in that time while he was losing his consciousness , **this is not loss of consciousness** unless he was told by one was near him (he cannot describing it)
- After gaining the conscious, patient will be in the **post ictus state** in which the patient will feel sleepy and go to sleep (if seizures is lasting longer ,the post ictus symptoms become more and if it is brief , patient may have no post ictus).
- Most people mix the ictus and post ictus together.
- Preictus, ictus, and postictus is happened **only in generalized**.

**TYPES OF GENERALIZED** : (Tonic-clonic, Atonic, Absence, Ayoclonic & Tonic)

a) **Tonic-Clonic (Grand Mal) (the most common)** :

- At first , patient screams then go it the tonic phase then to the clonic phase.
- In tonic, the body becomes rigid & extended (extended hands, neck and back) & the tongue usually bitten & it is lasting for fractions of minute & patients may develop cyanosis.
- Then, followed by clonic which the whole body contract & it may last seconds to minutes.
- Tonic alone rarely happen.

b) **Absence (petit mal) (common)** :

- Each attack accompanied by **3 Hz spike and wave** EEG activity.
- Patients stares upward and he is not responding at this time and pales for a few seconds.
- The eyelid twitch , few muscles jerk may occur.
- After the attack, normal activity is resumed.

★ **Typical absence attack are NEVER due to acquired lesions such as tumor.**

- It is most common in children in school & they are scoring bad marks & tend to develop generalized tonic-clonic in adult life (primary Generalized epilepsy).

c) **Myoclonic:**

- Describing isolated muscle jerking.
- Could be physiological at night when the body suddenly contract (before sleeping).
- This type is common in Juvenile Myoclonic Epilepsy (JME) & associated with loss of consciousness at time of attack.
- **It is very brief.** Pts doesn't fall down.

d) **Tonic:** seizures describing intense stiffening of the body not followed by convulsive jerking. **(it is rare)**

e) **Atonic:** sudden loss of tone with falling & loss of consciousness **(very rare).**

**PSEUDOSEIZURES:**

- It is not true epilepsy.
- Some of them mimic epilepsy.
- More common in female.
- May be receiving treatment but they are not responding.
- Patients usually don't urinate (but some of them may go to the end and urinate on themselves) or bite their tongue & **they try to protect themselves.**
- Triggered by emotional upset.
- Tendencies occur in company.
- **5-20% of epilepsy clinic patients have pseudoepilepsy. (MCQ)**
- Some of true epileptic patient may have pseudoepilepsy.
- 20-30% of epileptic population may have pseudoseizure.
- 20-30% of uncontrolled epilepsy also have pseudoseizure.

**DIFFERENTIAL DIAGNOSIS:**

- Syncope
- Psychogenic pseudoseizure
- Panic, anxiety, hyperventilation (hv) attack.
- Movement disorder
- Sleep disorder (narcolepsy, parasomnia)
- Hypoglycemia.
- TIA (transient ischemic attack)
- Migraine.
- Pheochromocytoma.

## INVESTIGATIONS:

### 1. **EEG: useful test , despite limitations.**

- During attack EEG is almost abnormal
- 3 Hz spike and wave happen in petit mal
- **Normal EEG** between attack (interictal) **does not exclude epilepsy.**
- There is 30% chance to get subclinical discharges.
- Abnormal interictal EEG it confirm the diagnosis.
- EEG videotelemetry is used to study attacks of uncertain nature.

### 2. **CT & MRI:** In practice , CT is reasonable test for detecting tumor or any structural abnormality in adult , but **MRI is better & used routinely** if available.

★ In children, you have to do other investigations, like CBC, U&E , ANA, Ca<sup>++</sup>, ESR, and others to exclude other causes of seizure. Also in adult but it is very rare to do it.

★ The basic investigations are EEG and MRI.

## SOME OF POSSIBLE AETIOLOGY:

1. Genetics predisposition & developmental anomalies.
2. Trauma, hypoxia & surgery.
3. **Pyrexia: can cause febrile convulsion which are not usually labeled as epilepsy.**
4. Brain tumors.
5. Vascular abnormality.
6. Alcohol , drugs & drug withdrawal.
7. Encephalitis & inflammatory condition .
8. Metabolic abnormality:
  - a. hypoglycemia \ calcemia \ natraemia.
  - b. acute hypoxia
  - c. uremia , liver failure
  - d. mitochondrial disease & porphyria.
9. Degenerative disorder such as Alzheimer & MS.
10. Provoked seizures ( photosensitivity)
11. Sleep deprivation.

## MANAGEMENT :

- Anticonvulsant drugs: best study in pharma lectures.
- Neurosurgical treatment: if there is structural lesion (focal lesion, fibrosis , post RTA or tumor) not primary generalized and if the pt is not controlled by medication or not mentally retarded and if he is fit to surgery we do it. Amputation of non dominant anterior temporal lobe can be performed in patients with uncontrolled seizures and hippocampal sclerosis. Sometimes section of corpus callosum & hemispherectomy are also used.

## WOMEN & EPILEPSY:

- Fertility:
  - There is some reduction of fertility in women with epilepsy.
  - One third of epileptic women have ovarian abnormality.
  - These are probably due to sodium valproate.
- Birth defect:
  - The overall risk of birth defects in babies of mother who takes anticonvulsant is around 7%.
- Contraception:
  - Anticonvulsant reduce efficacy of oral contraceptive.

**∴ THE END ∴**

Done by : Neuron team